



Something is “subsiding” in the state of Denmark - Operational prospects for nationwide subsidence mapping with Sentinel-1

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Publication date:
2016

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Marinkovic, P., Larsen, Y., Fredenslund Levinsen, J., Broge, N. H., Sørensen, C. S., & Dehls, J. (2016). Something is “subsiding” in the state of Denmark - Operational prospects for nationwide subsidence mapping with Sentinel-1. Poster session presented at ESA Living Planet Symposium 2016, Prague, Czech Republic.

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Something is 'subsiding' in the state of Denmark operational prospects for nationwide subsidence mapping with Sentinel-1

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Motivation

Why?

- ...to assess the potential and applicability of Copernicus Sentinel-1 for nationwide deformation mapping applications.
- ...what is the optimal (Sentinel-1 InSAR) deformation product from the end user perspective?
- ...free and open access to Copernicus data has a potential value to many end users, however, extraction of information from data is challenging.

What?

- ...a number of case studies in Denmark, and in long term the whole country.
- ...current focus on three urban areas with different subsidence phenomena.

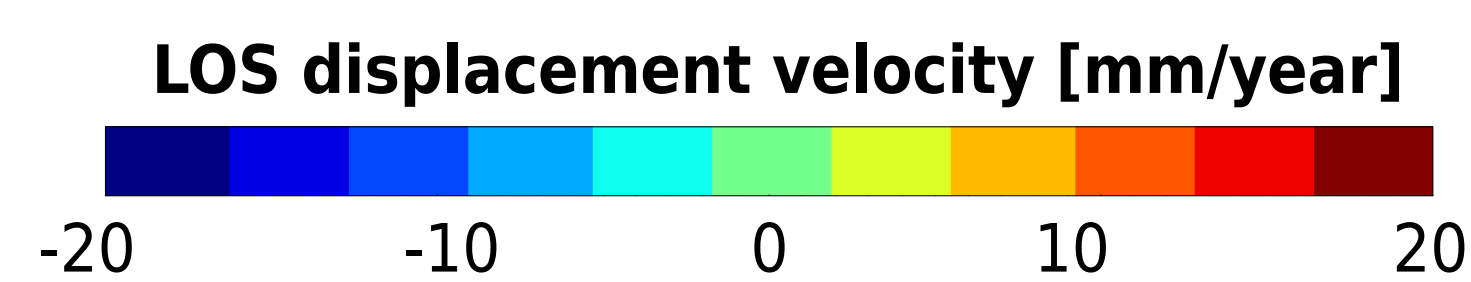
Processing & Analysis Methodology

How?

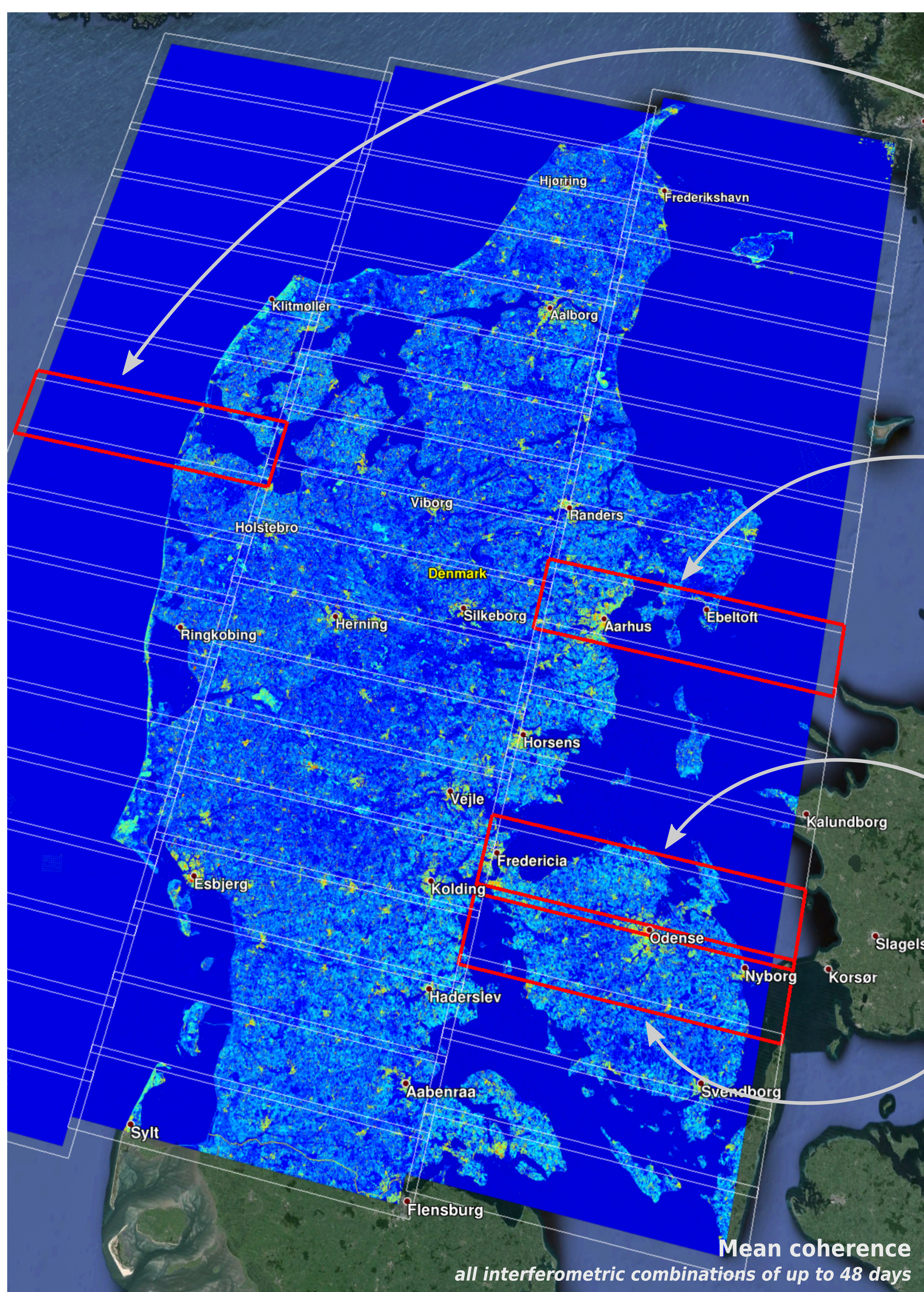
- ...routine InSAR processing of Sentinel-1 data and low resolution nationwide coherence analysis to assess the potential.
- ...time series analysis performed with the classical PSI ('vanilla') algorithms optimized for Sentinel-1 TOPS mode.

Data overview

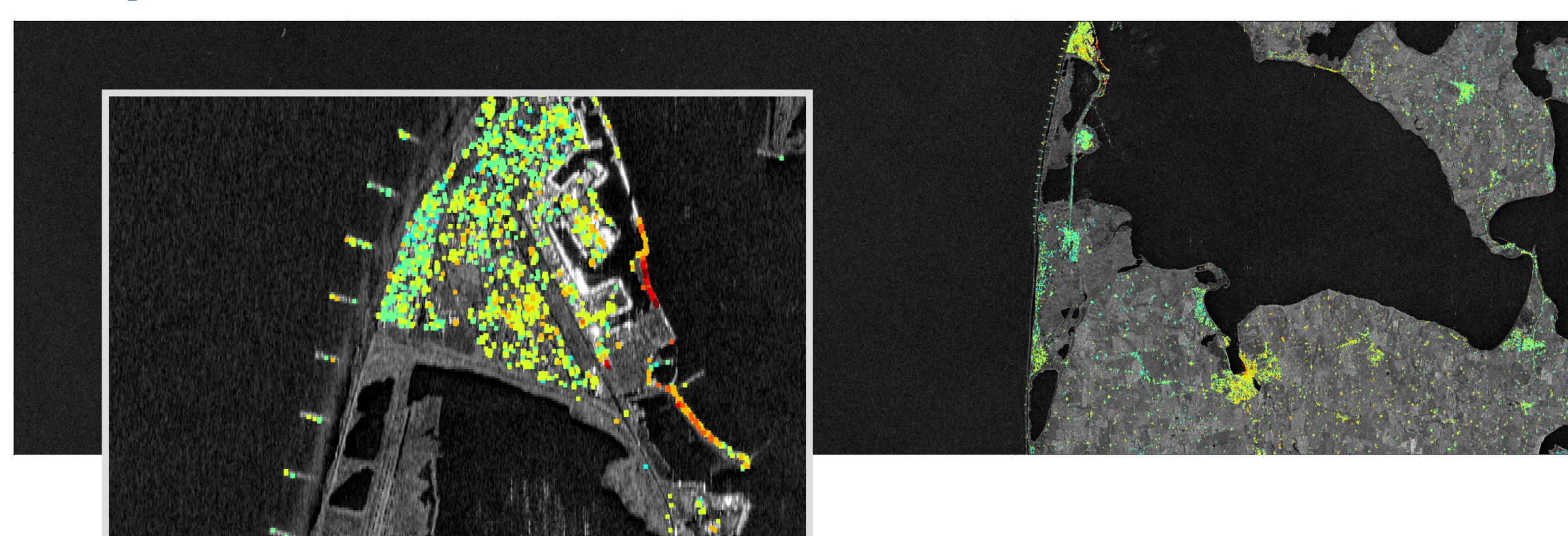
- ...all available data from descending track 139D:
- ...observation window of 1 year (March 2015 - March 2016),
- ...in total 27 scenes x 3 slices utilized.



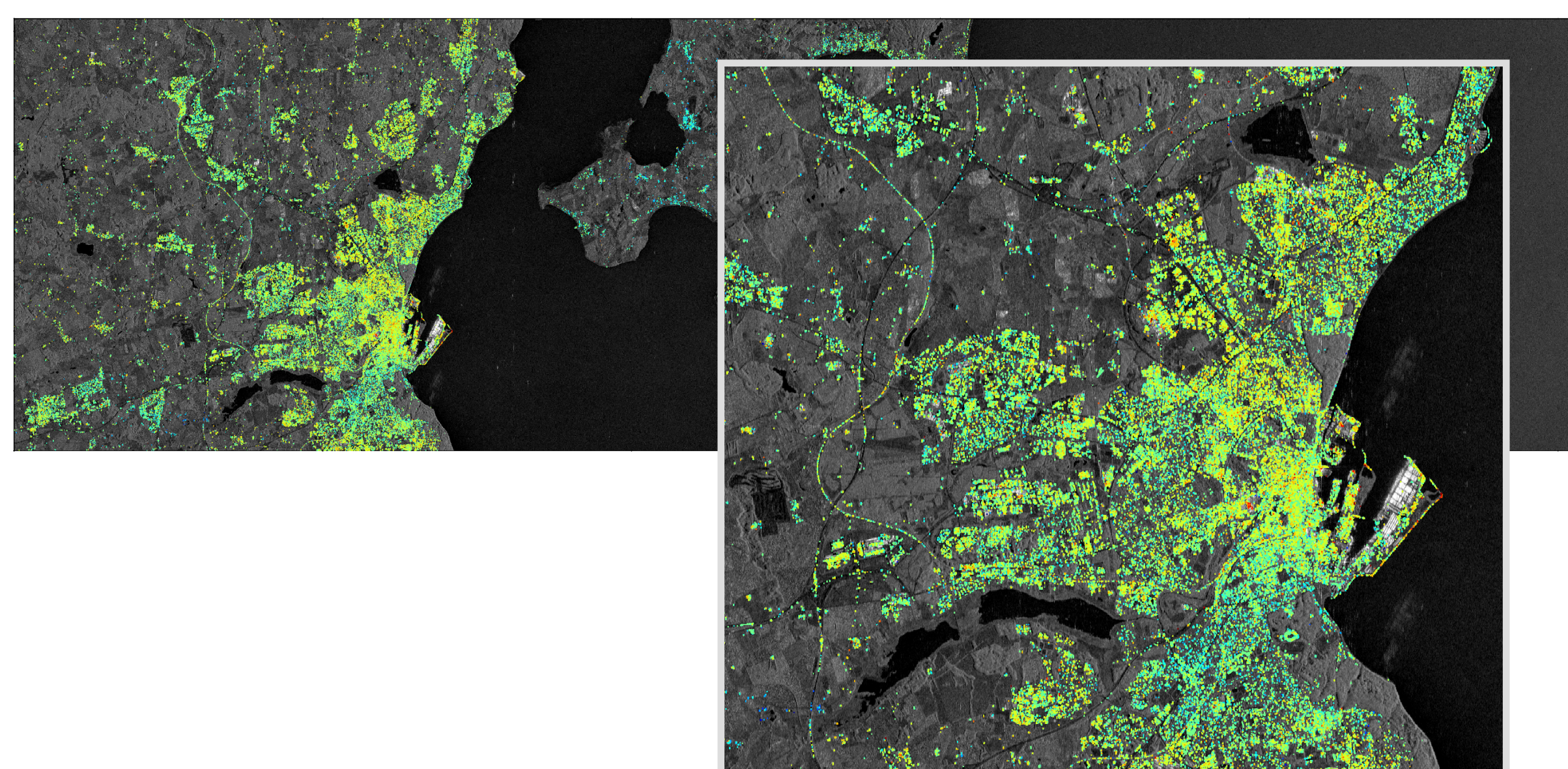
Results overview



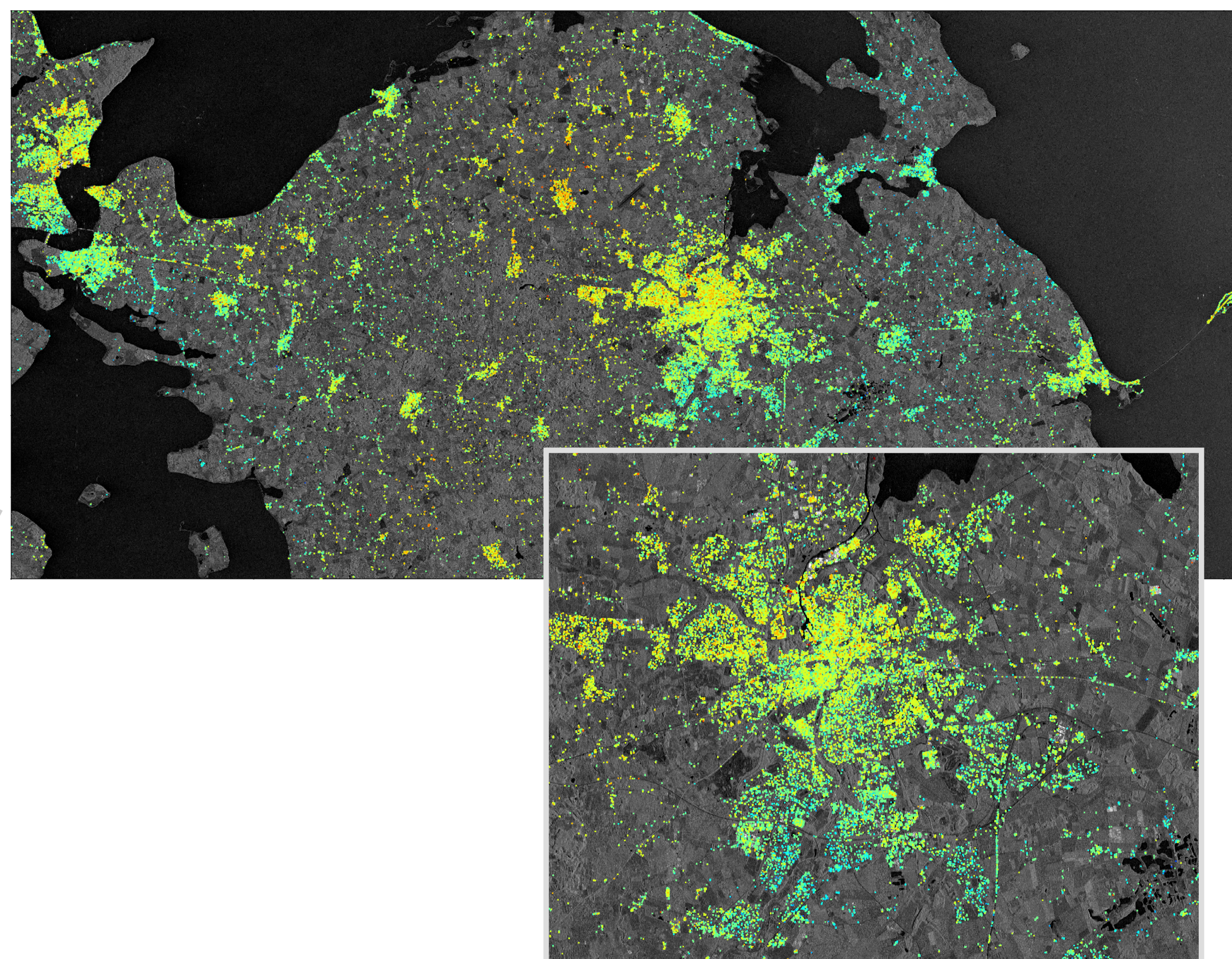
Thyborøn



Aarhus



Odense



Outlook & Open Challenges

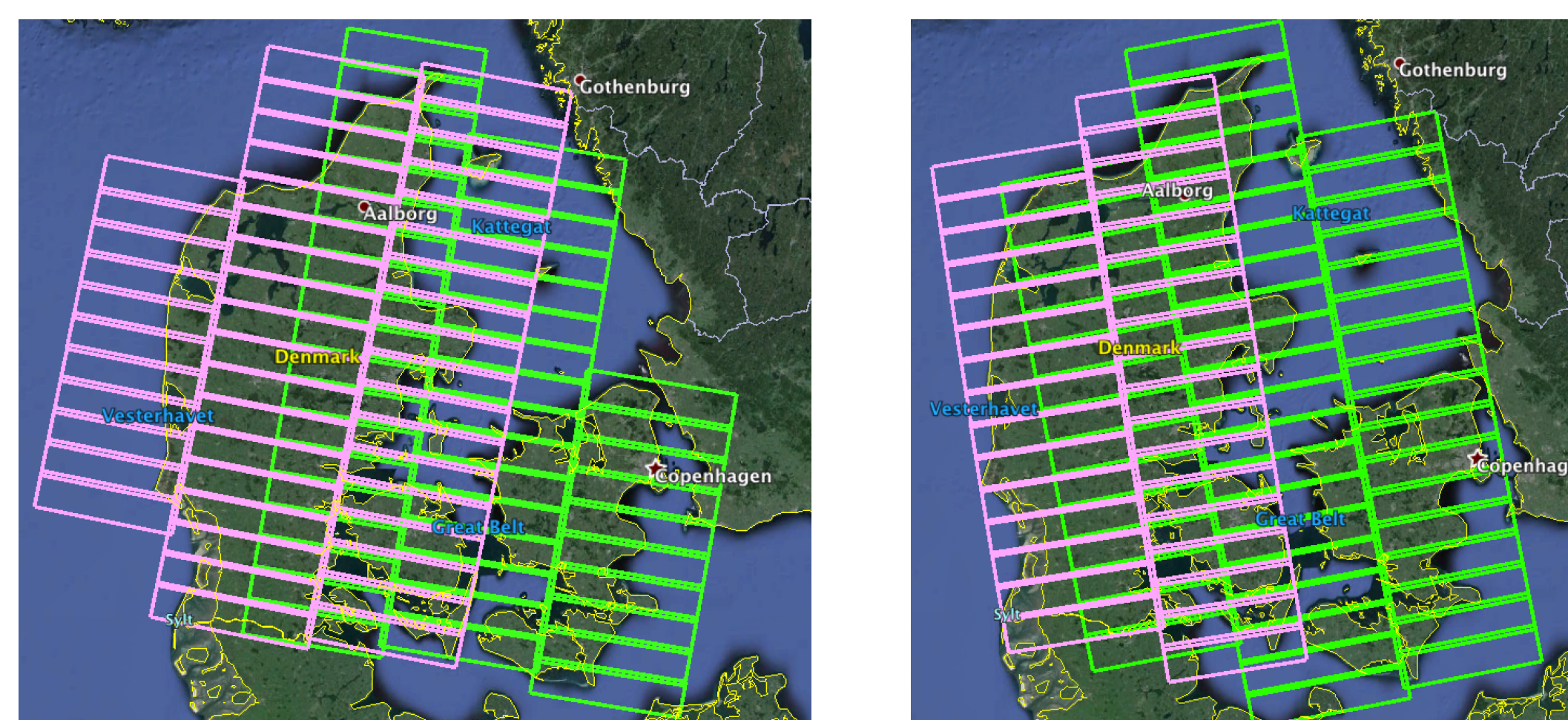
Technical challenges

- ...how to integrate algorithmic state-of-the-art in a single processing system?
- ...how to operationally deploy the re-defined state-of-the-art?
- ...how to optimally perform "coherence mining" through the large graph of Sentinel-1 data?

Results dissemination challenges

- ...what are the specific types of products needed by the end user community?
- ...how to communicate results to non-InSAR communities?

We are happy to discuss and share our initial experiences on all of these questions!



Full coverage of Denmark by Sentinel-1

Descending tracks: 66 and 139
Ascending tracks: 44 and 117

Acknowledgment: All results contain modified Copernicus data (2015-2016)